IN THE CLAIMS

WE CLAIM:

1. A catalytic cavitation reactor comprising:

an inner pipe having a wall with plurality of spaced apart radially bored inner pipe holes located thereon, an entry end and an exit end having a cap thereon;

a second pipe, joined to said inner pipe, having a wall with plurality of spaced apart radially bored second pipe holes located thereon, an entry end and an exit end having a cap thereon, said inner pipe located within said second pipe;

a length of static mixing baffles are inserted into the interior of said second pipe between the area containing the inner pipe holes and the second pipe holes;

an outer pipe, joined to said second pipe, an entry end and an exit end having a cap thereon, said second pipe located within said outer pipe;

a length of static mixing baffles are inserted into the interior of said outer pipe between the area containing the second pipe holes and the outer pipe holes; and

a plurality of nozzles, wherein each of said inner pipe holes and second pipe holes receives one of said plurality of nozzles, each of said plurality of nozzles having an inlet end, an outlet end and a constriction therebetween, a catalytically active zone is formed between said said constriction and said outlet end.

2. The reactor of claim 1 wherein each of said plurality of nozzles is positioned in each of said inner pipe holes and second pipe holes at an angle relative to the wall of the respective pipes.

3. The reactor of claim 2 wherein said angle is 22.5 degrees relative to the wall of the respective pipes.

4. The reactor of claim 1 wherein said constriction is formed from erosion resistant material.

5. The reactor of claim 4 wherein said catalytically active zone is formed by catalytically active material.

6. The reactor of claim 1wherein said catalytically active zone is dimensionally formed as a straight cylindrical barrel.

7. The reactor of claim 1 wherein said catalytically active zone is dimensionally formed as a single cylinder.

8. The reactor of claim 1 wherein said catalytically active zone is dimensionally formed as a multi-chambered cylinder.

9. The reactor of claim 1 wherein said catalytically active zone is dimensionally formed as a venturis.

10. The reactor of claim 1 wherein said catalytically active zone is dimensionally formed as a converging cones.

11. The reactor of claim 1 wherein said catalytically active zone is dimensionally formed as a diverging cones.

12. The reactor of claim 1 wherein said catalytically active zone is dimensionally formed as a threaded cylinder.

13. The reactor of claim 1 wherein said catalytically active zone is dimensionally formed as a ball chambered cylinder.

14. The reactor of claim 1wherein said catalytically active zone is dimensionally formed as a spherical chambered cylinder.

15. The reactor of claim 1 wherein the diameter of inner pipe is greater than ½ inch.

16. The reactor of claim X wherein the sum of cross-sectional areas of said plurality of nozzles located in said inner pipe holes is approximately 2 times the cross-sectional area of said inner pipe.

17. A method for the separation of contaminants within a fluid comprising:

mixing a fluid containing contaiminants;

transferring said fluid into a reactor having nozzles as defined by claim 1;

passing said fluid through said nozzles causing cavitation and ionization of said fluid;

removing said fluid contaiminants from said fluid.